AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions, and listings, of claims in the captioned patent application:

Listing of Claims

1. (Currently Amended) A rotary screw machine of volume type comprising:

a body having a main axis X;

two members ~~consisting of~~ further comprising:

a male member; and

a female member surrounding said male member,

wherein an outer surface of the male member defines a male surface and ~~a~~ an inner surface of the female member defines a female surface,

said male and female surfaces being helical surfaces having respective axes Xm and Xf that are parallel and spaced apart by a length E,

said male and female surfaces defining at least one working chamber by formation of linear contacts of said male and female surfaces and relative displacement of said male and female members,

said male and female surfaces being further defined about said axes Xm and Xf, respectively, by a nominal profile in a cross section of the mechanism,

said profile of the male surface defining a male profile having an order of symmetry Nm with respect to a center Om located on said male axis Xm,

said profile of the female surface defining a female profile having an order of symmetry Nf with respect to a center Of located on said female axis Xf,

said rotary screw machine further having a main synchronizing coupling comprising a crank like mechanism generating an eccentricity E between said main axis X and one of the axes (Xm, Xf),

~~characterized~~ in that a first one of said male member and said female member is hinged in said body and is able to rotate on itself about its fixed axis (Xm; Xf) according to a rotational motion,

in that the crank like mechanism 32 further comprises:

a first shaft like end 32', and

a second shaft like end 32" hinged in the body 30, parallel to the first shaft like end 32' with said length E between the first shaft like end and the second shaft like end,

in that said crank like mechanism is connected to the other of said male member or said female member not hinged in said body to allow the axis (Xf; Xm) of said other of said male member or said female member to revolve about the fixed axis (Xm; Xf) of said first one of said male member and said female member according to an orbital revolution motion having said length E as a radius, and

in that said rotary screw machine comprises a main synchronizer synchronizing said swiveling motion and said orbital revolution motion, one with respect to the other, so that said male and female mesh together.

2. (Currently Amended) A rotary screw machine of claim 1, further comprising:

rotational transmission means connected to said crank organ or to said first one of said male member and said female member.

3. (Withdrawn) A rotary screw machine according to claim 2, characterized in that said rotational transmission means (131) is a two-channel rotational means (131).

4. (Currently Amended) A rotary screw machine of claim 1, wherein said male and female surfaces are brought in mechanical contact forming a kinematic pair allowing the transmission of motion between said ~~first~~ male and ~~second~~ female members.

5. (Currently Amended) A rotary screw machine of claim 1, further comprising:

an additional synchronizer, linked to said body and allowing said ~~second member~~ other one of said male member or said female member to rotate about its axis.

6. (Previously Presented) A rotary screw machine of claim 5, wherein said additional synchronizer comprises a planetary gear transmission.

7. (Previously Presented) A rotary screw machine of claim 5, further comprising:

rotational transmission means connected to said crank organ and to one of said male or female member.

8. (Withdrawn) A rotary screw machine according to Claim 1, characterized in that said synchroniser further comprises a kinematical coupling mechanism (40, 36, 38; 44, 46, 48) of both members (10; 500; 600; 700; 20; 600; 700; 800) together, said kinematical coupling comprising at least one coupling organ (36; 46), which is hinged in said body (30).

9. (Withdrawn) A rotary screw machine according to claim 8, characterized in that said kinematical coupling mechanism comprises a gear transmission (40, 36, 38; 44, 46, 48).

10. (Withdrawn) A rotary screw machine according to Claim 1, characterized in that said synchronizer comprises a planetary gear transmission (54, 56).

11. (Withdrawn) A rotary screw machine according to Claim 1, characterized in that said synchronizer comprises an inverter (58).

12. (Withdrawn) A rotary screw machine according to Claim 1, characterized in that said synchronizer comprises a coulisse mechanism (59, 60, 61).

13. (Withdrawn) A rotary screw machine according to Claim 1, characterized in that it further comprises at least one additional male and female members (500; 600; 700; 600; 700; 800) disposed in line with said male and female members.

14. (Withdrawn) A rotary screw machine according to Claim 1, characterized in that it further comprises at least a third member disposed inside or surrounding said male and female members (500; 600; 700; 600; 700; 800), in such a way that their surfaces are in mechanical contact so as

to form additional chambers (11).

15. (Previously Presented) A rotary screw machine claim 1, wherein said female order of symmetry Nf is equal to Nm - 1.

16. (Withdrawn) A rotary screw machine according to Claim 1, characterized in that said female order of symmetry Nf is equal to Nm + 1.

17. (Previously Presented) A rotary screw machine of claim 1, wherein said male or said female surfaces can degenerate into cylindrical surfaces.

18. (Withdrawn) A method of transforming a motion in a volume screw machine, the method comprising:

(a) creating an interconnected motion of screw conjugated elements in the form of male and female members and links of synchronizing coupling with the help of converted positive flows of mechanical energy and working substance energy in working chambers of said volume screw machine;

(b) driving one of male or female member into a planetary motion with two degrees of freedom of mechanical rotation one of which being an independent degree of freedom relative to the fixed central axis of the other member; and

(c) transmitting said positive energy flows of conversion through an independent degree of freedom of mechanical rotation of said machine.

19. (Withdrawn) The method according to claim 18, further comprising creating a differentially connected motion of male and female members and links of synchronizing coupling with a second independent degree of freedom of a rotary motion and the transmission of the positive energy flow of conversion in the form of the two flows through the two independent degrees of freedom.

20. (Withdrawn) The method according to Claim 18, in which the third, at least one dependent degree of freedom of rotary motion, can be created in the process of transforming a motion of male and female members and links of synchronizing coupling, and a part of positive energy flow of conversion inside said machine, is used in transforming a motion through an additional dependent degree of freedom of mechanical rotation of said machine with decreasing the number of independent degrees of freedom per unity.

21. (Withdrawn) The method according to Claim 18, in which the angular velocities of said members are determined according to the expression:

$$k_1\omega_1+k_2\omega_2+\omega_3=O,$$

where: ω_1,ω_2 represent the angular speed of the said conjugated elements about their axis;

ω_3 represents the angular speed of the link of synchronizing coupling;

k_1,k_2 represent the constant coupling coefficients; herewith, values of angular velocities of rotation of conjugated elements are defined from expression:

$$(z-1)\omega_1 - z\omega_2 + \omega_0 = 0,$$

where: ω_1 represents is the angular speed of the member around its axis, enveloping surface of which has the form of curvilinear surface;

ω_2 represents the angular speed of rotation of the member around its axis, enveloping surface of which has a shape of inner or outer envelope of a family of surfaces, formed with the said curvilinear surface;

ω_0 represents the angular speed of the orbital revolution of the axis of the member executing planetary motion;

z represents an integer, $z > 1$.

22. (Withdrawn) The method according to Claim 18, in which any two of the three rotations can be synchronized between one another, namely, the rotation of one of the conjugated elements about their fixed axis, the revolution of an axis of the member performing a planetary motion with the link of synchronizing coupling and the swiveling of the member with a movable axis.